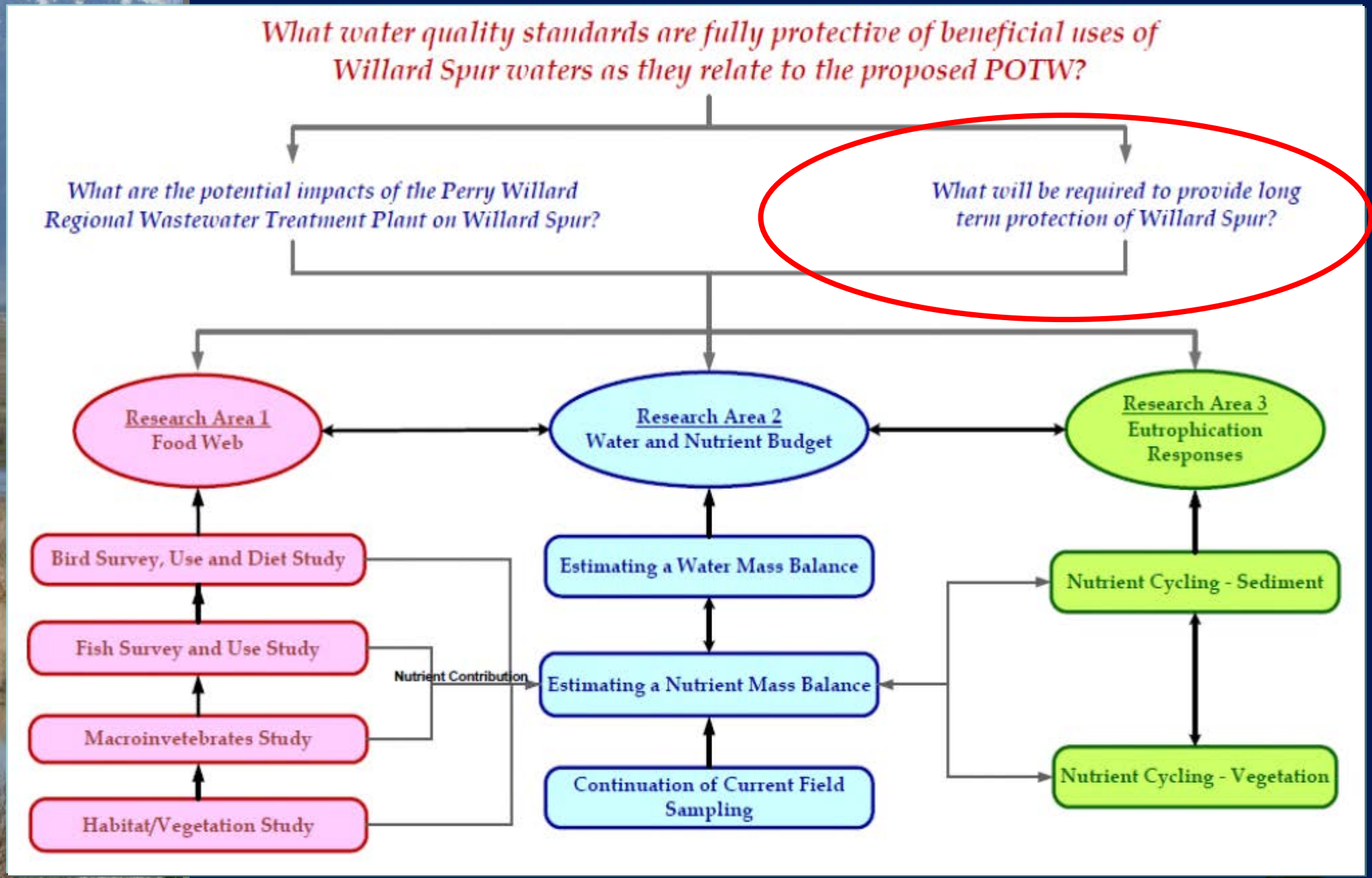
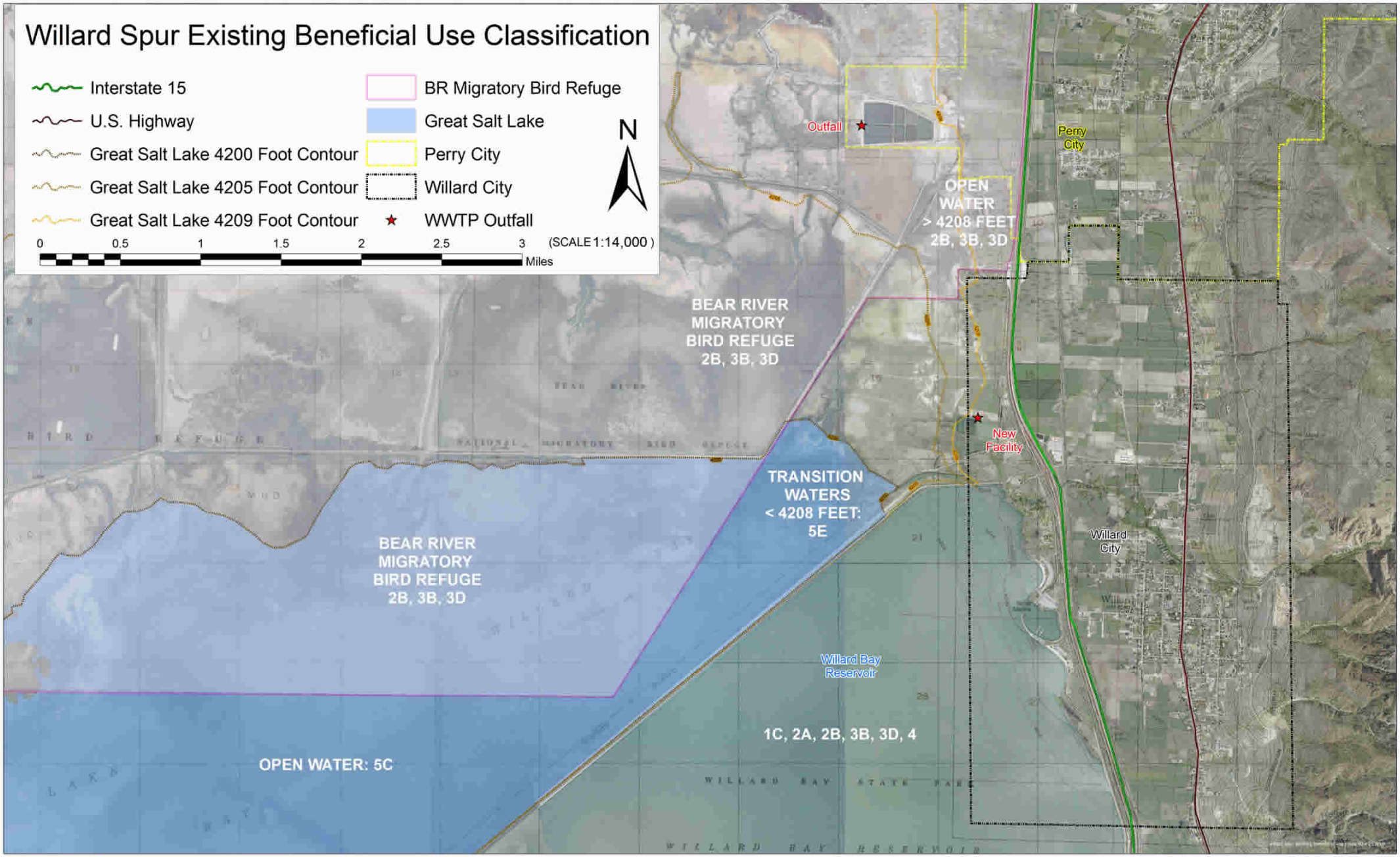
Regulatory Background


What water quality standards are fully protective of beneficial uses of Willard Spur waters as they relate to the proposed POTW?
What are the potential impacts of the Perry Willard Regional Wastewater Treatment Plant on Willard Spur?
What will be required to provide long term protection of Willard Spur?
Research Area 1
Food Web
Research Area 2
Water and Nutrient Budget
Research Area 3
Eutrophication Responses
Bird Survey, Use and Diet Study
Fish Survey and Use Study
Macroinvetebrates Study
Habitat/Vegetation Study
Nutrient Contribution
Estimating a Water Mass Balance
Estimating a Nutrient Mass Balance
Continuation of Current Field Sampling
Nutrient Cycling - Sediment
Nutrient Cycling - Vegetation


Willard Spur Existing Beneficial Use Classification
Interstate 15
U.S. Highway
Great Salt Lake 4200 Foot Contour
Great Salt Lake 4205 Foot Contour
Great Salt Lake 4209 Foot Contour
BR Migratory Bird Refuge
Great Salt Lake
Perry City
Willard City
WWTP Outfall
N
0 0.5 1 1.5 2 2.5 3 Miles
(SCALE 1:14,000)
Outfall
Perry City
OPEN WATER > 4208 FEET 2B, 3B, 3D
BEAR RIVER MIGRATORY BIRD REFUGE 2B, 3B, 3D
New Facility
TRANSITION WATERS < 4208 FEET: 5E
BEAR RIVER MIGRATORY BIRD REFUGE 2B, 3B, 3D
Willard City
Willard Bay Reservoir
1C, 2A, 2B, 3B, 3D, 4
OPEN WATER: 5C

Antidegradation (UAR 317-2-3)

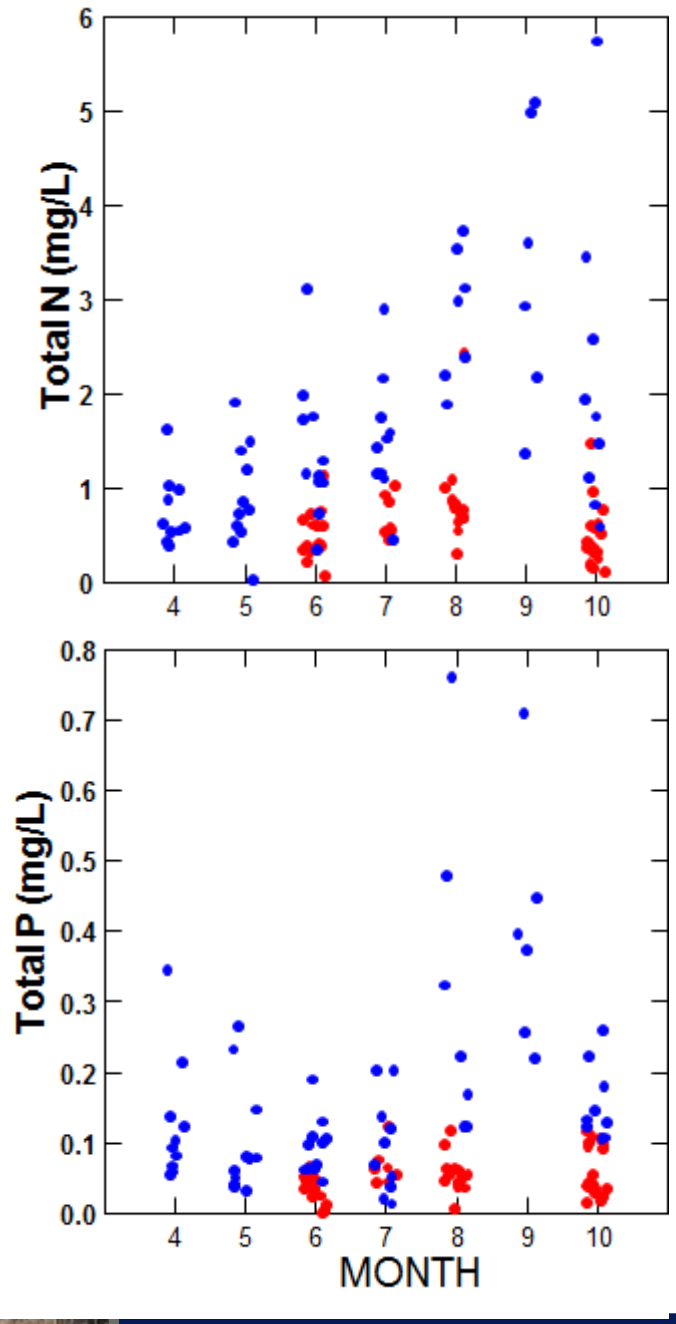
WQB Petition: Designate Willard Spur as a "Category 2" Waterbody

What does this mean?

"…a point source discharge may be permitted provided that the discharge does not degrade existing water quality"

Antidegradation: Considerations

- What constitutes “background” conditions?



- Significant temporal variation in nearly all WQ parameters

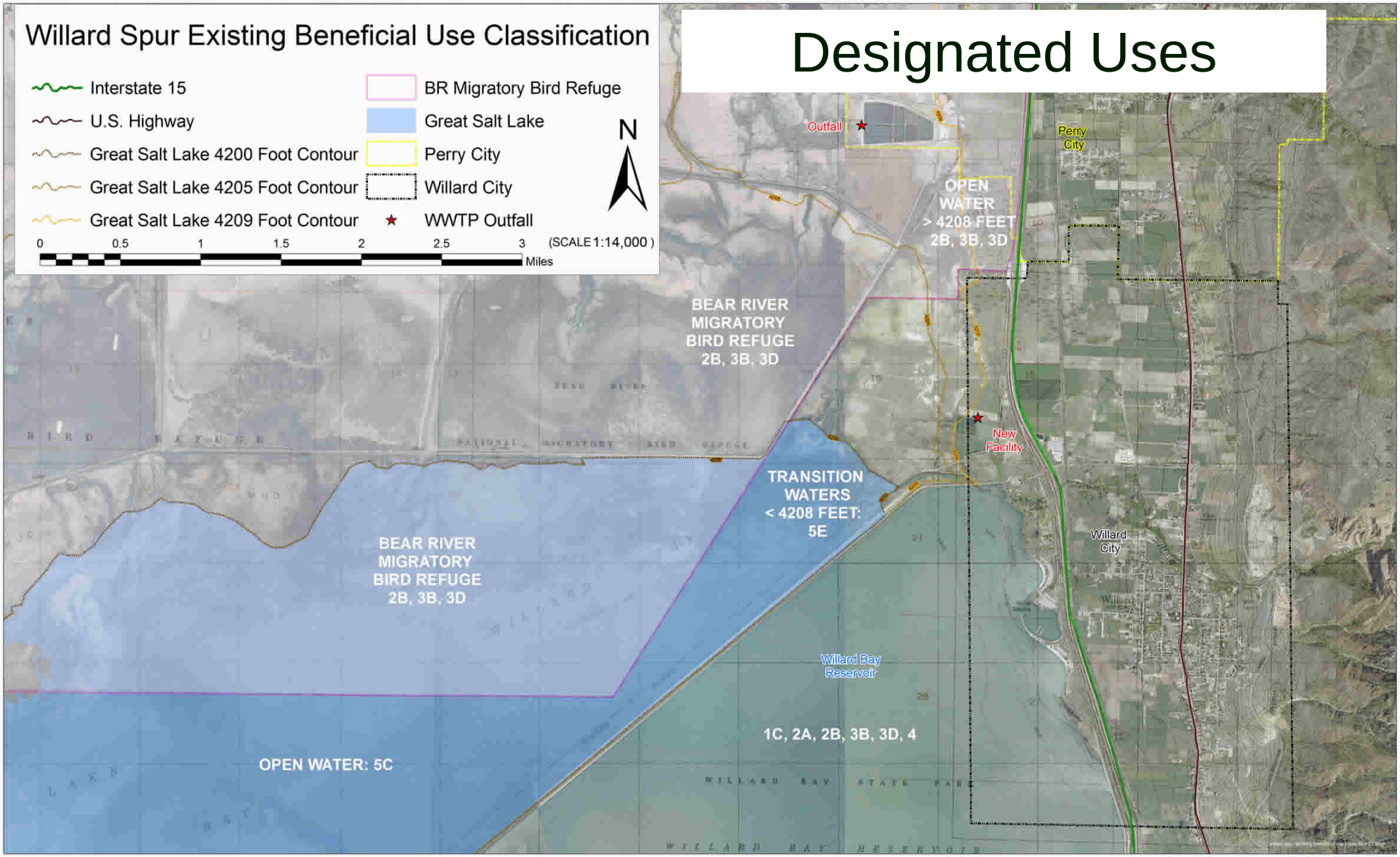
Antidegradation: Considerations

- What constitutes “background” conditions?
- Only addresses point sources as stressors of concern, not
  - Hydrologic Modification
  - Phragmites
  - Other sources of nutrients & other contaminants

Antidegradation: Considerations

- What constitutes “background” conditions?
- Only addresses point sources as stressors of concern, not…
- How to define Willard Spur boundaries?
  - How to address high GSL levels
  - Lakeside boundary?
  - Tailrace included?

Designated Uses



Aquatic Life Uses

The goal of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

"the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region."

Utah's Aquatic Life Uses (R317-2-6)

- **3B**: Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- **3D**: Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes…3B including the necessary aquatic organisms in their food chain.
- **5E**: Protected for …waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

What do we know about WS?

- Warm water fish, including natives and game fish are present:
  - Common carp
  - Utah Chub
  - Gizzard Shad
  - Black bullhead
- All species are tolerant of temperature and low DO
- All species eat bugs, zooplankton, plant material/detritus (“necessary in food chain”)

What do we know about WS?

High Water Conditions

Low Water Conditions

AL Uses: Considerations

- Are the broad descriptions of uses sufficient? Are they appropriate?
  - DWQ intends to refine uses
  - Wetlands truly have unique characteristics
- Any changes that decrease WQ protections will require a Use Attainability Analysis

Numeric Criteria Considerations

- 3A numeric criteria are roughly the same for all AL uses except:
  - Max Temperature: 3A, 3B = 27ºC; 3D = nill
  - DO* min (ppm).: 3A/3B = 6/4; 3D=3
- *Footnote excludes GSL "impounded wetlands" from DO

Narrative Water Quality Standards

UAR 317-3-7.2

It shall be unlawful…will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life…; or result in…undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects...

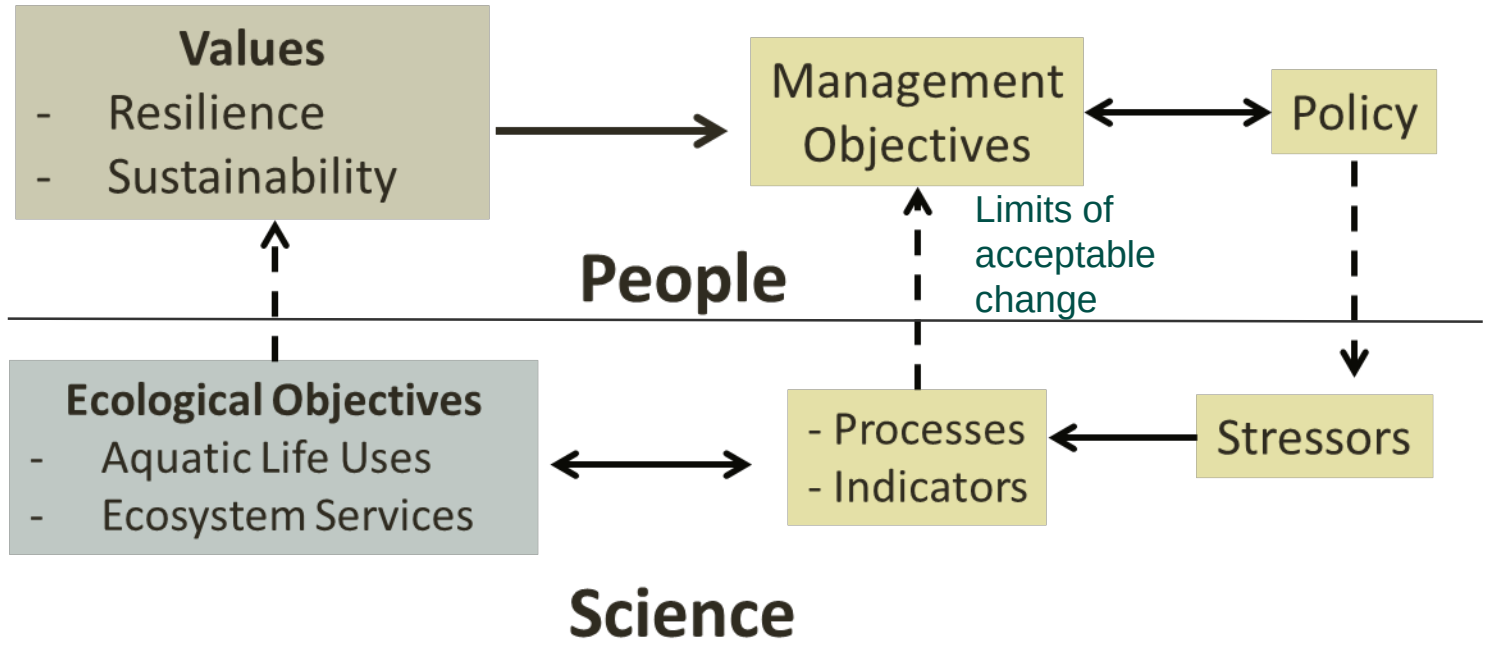
Biological Narrative

Waters of the State shall be free from human-induced stressors which will degrade the beneficial uses as prescribed by the biological assessment processes and biological criteria set forth below…

a. …may be used to assess whether the purposes and designated uses identified in R317-2-6 are supported….

c. Quantitative biological assessments shall use documented methods that have been subject to technical review and produce consistent, objective and repeatable results that account for methodological uncertainty and natural environmental variability.

Water Quality Regulation: Values, Objectives and Associated Indicators



Example*

WQ Objective

- Chemical constituents in water and sediment do not cause harm to fish and wildlife

Indicators

- Increased concentrations of key constituents in sediment (integrative)
- Increased concentrations of key constituents in the water column

Management Objectives

- Develop and implement a M&A strategy

*See handout for others and details

Fleshing Out the Details

Index Period Considerations

- The “green phase” seems most limiting, but
  - Year-to-year variation
  - Difficult to implement

Key Indicators vs. Comprehensive List

- Link to biological integrity
- Implementable

Overlap is Acceptable (even desirable)

- Among management programs/agencies
- Among categories
- Among objectives